# APPARATUS AND METHOD FOR USE IN DIFFERENT AMBIENT LIGHTING CONDITIONS

## TECHNOLOGICAL FIELD

[0001] Embodiments of the present invention relate to an apparatus for use in different ambient lighting conditions.

## BACKGROUND

[0002] An apparatus that is usable in certain ambient lighting conditions may not be easily usable in other ambient lighting conditions.

[0003] Examples of different ambient fighting conditions may, for example, include low lighting/darkness, strong sunlight, and artificial lighting.

## BRIEF SUMMARY

[0004] According to various, but not necessarily all, embodiments of the invention there is provided an apparatus comprising: an artificial visible light source;

[0005] a layer of photochromic material overlying the artificial light source;

[0006] a layer of opaque material overlying the layer of photochromic material; and one or more apertures through the layer of opaque material.

[0007] According to various, but not necessarily all, embodiments of the invention there is provided a method comprising: providing an artificial visible light source; providing a layer of photochromic material as a filter for the artificial light produced by the artificial light source; and providing a layer of opaque material, with one or more apertures through the layer of opaque material, as a mask for the filtered artificial light.

## BRIEF DESCRIPTION

[0008] For a better understanding of various examples of embodiments of the present invention reference will now be made by way of example only to the accompanying drawings in which:

[0009] FIG. 1 illustrates example of an apparatus that presents information to a user differently in different ambient lighting conditions;

[0010] FIG. 2A illustrates an example of an apparatus when the apparatus receives natural sunlight or ultraviolet light and information is presented by a contrast between photochromic material that is visible through aperture(s) in an opaque layer and the opaque layer;

[0011] FIG. 2B illustrates an example of the apparatus, illustrated in FIG. 2A, when the apparatus does not receive natural sunlight or ultraviolet light and information is presented by a contrast between backlit photochromic material that is visible through aperture(s) in the opaque layer and the opaque layer;

[0012] FIG. 3 illustrates another example of an apparatus that presents information to a user differently in different ambient lighting conditions;

[0013] FIG. 4 illustrates an example of a device comprising one or more apparatuses;

[0014] FIG. 5A illustrates photochromic material in the presence of ultraviolet light acting as a filter absorbing ambient visible light received via aperture(s) in the opaque layer; and

[0015] FIG. 5B illustrates photochromic material in the absence of ultraviolet light acting as a filter transmitting visible light generated by an underlying artificial visible light source.

## DETAILED DESCRIPTION

[0016] The figures illustrate an apparatus 10 comprising: an artificial visible light source 8; a layer of photochromic material 2 overlying the artificial light source 8; a layer of opaque material 4 overlying the layer of photochromic material 2; and one or more apertures 6 through the layer of opaque material 4.

[0017] FIGS. 1 and 3 both illustrate examples of an apparatus 10 that presents information to a user differently in different ambient lighting conditions. The information may therefore be legible in different ambient lighting conditions.

[0018] The apparatus 10 comprises: an artificial visible light source 8; a layer of photochromic material 2 overlying the artificial light source 8; a layer of opaque material 4 overlying the layer of photochromic material 2; and one or more apertures 6 through the layer of opaque material 4.

[0019] When the apparatus 10 receives ambient natural sunlight 13 or ultraviolet light, as illustrated in FIG. 2A, information 5 is presented by a contrast between photochromic material 2 that is visible through one or more apertures 6 and a layer of opaque material 4 through which the one or more apertures 6 are made.

[0020] For example, as illustrated in FIG. 5A, the photochromic material 2 in the presence of ultraviolet light may act as a filter absorbing ambient visible light 13 received via aperture(s) 6 in the opaque material 4 giving the photochromic material a dark appearance or a black color.

[0021] The layer of opaque material 4 reflects at least some of the ambient visible light 13. The layer of opaque material 4 may be colored to contrast with the dark/black material 2. It may, for example, be colored white. The layer of opaque material 4, with the aperture(s) 6, forms a mask through which the dark photochromic material 2 can be seen. The apertures 6 in the mask are designed to convey information 5 by selectively presenting the dark photochromic material 2 through the mask aperture(s) 6.

[0022] When the apparatus 10 receives ambient artificial visible light 11 without ultraviolet light or receives no light, as illustrated in FIG. 2B, information 5 is presented by backlighting the photochromic material 2 through the one or more apertures 6 in the layer of opaque material 4.

[0023] For example, as illustrated in FIG. 5B, the photochromic material 2 in the absence of ultraviolet light (or sufficient ultraviolet light) may filter visible light 11 generated by an artificial visible light source 8. It may, for example, be transparent or translucent to visible light 11 generated by an artificial visible light source 8.

[0024] The layer of opaque material 4 may be colored to contrast with the filtered visible light 11. It may, for example, be colored white. The layer of opaque material 4, with the aperture(s) 6, therefore forms a mask through which the visible light 11 generated by an artificial visible light source 8 can be seen. The apertures 6 in the mask are designed to convey information 5 by selectively presenting the visible light 11 generated by the artificial visible light source 8 through the mask aperture(s).

[0025] The photochromic material 2 changes state in the presence of ultraviolet light. The change is reversible. The